Contents

VOLUME 12 NUMBER 1

MicroReviews

1 **Cytochrome *c* biogenesis in bacteria: a possible pathway begins to emerge**
L. Thöny-Meyer, D. Ritz & H. Hennecke

11 **The mechanism of transcription termination by RNA polymerase I**
R. H. Reeder & W. Lang

17 **Promiscuous DNA transfer system of *Agrobacterium tumefaciens*: role of the *virB* operon in sex pilus assembly and synthesis**
C. I. Kado

Research Articles

23 **A mutation in the receiver domain of the *Agrobacterium tumefaciens* transcriptional regulator VirG increases its affinity for operator DNA**
D. C. Han & S. C. Winans

31 **Mutations that affect regulation of the *korB* gene of *Streptomyces lividans* plasmid pIJ101 alter plasmid transmission**
J. T.-N. Tai & S. N. Cohen

41 **Regulation of transcription of the *cel1* gene in *Agaricus bisporus***
E. Yagüe, D. A. Wood & C. F. Thurston

49 **Replication control of plasmid R1: disruption of an inhibitory RNA structure that sequesters the *repA* ribosome-binding site permits *tap*-independent RepA synthesis**
P. Blomberg, H. M. Engdahl, C. Malmgren, P. Romby & E. G. H. Wagner

61 **Structural and functional diversity among bacterial interspersed mosaic elements (BIMEs)**
S. Bachellier, W. Saurin, D. Perrin, M. Hofnung & E. Gilson

71 **Longus: a long pilus ultrastructure produced by human enterotoxigenic *Escherichia coli***
J. A. Girón, M. M. Levine & J. B. Kaper

83 **Expression of the *nmpC* gene of *Escherichia coli* K-12 is modulated by external pH. Identification of *cis*-acting regulatory sequences involved in this regulation**
J. L. Coll, M. Heyde & R. Portalier

95 **The *pdhR–aceEF–lpd* operon of *Escherichia coli* expresses the pyruvate dehydrogenase complex**
M. A. Quail, D. J. Haydon & J. R. Guest

105 **Insertion of a novel DNA sequence, IS*1186*, upstream of the silent carbapenemase gene *cfiA*, promotes expression of carbapenem resistance in clinical isolates of *Bacteroides fragilis***
I. Podglajen, J. Breuil & E. Collatz

115 **The concentrations of stable RNA and ribosomes in *Rickettsia prowazekii***
H. Pang & H. H. Winkler

121 **Phosphorolytic error correction during transcription**
R. T. Libby & J. A. Gallant

131 **Analysis of the multimer resolution system encoded by the *parCBA* operon of broad-host-range plasmid RP4**
L. Eberl, C. S. Kristensen, M. Givskov, E. Grohmann, M. Gerlitz & H. Schwab

143 **Protein H—a surface protein of *Streptococcus pyogenes* with separate binding sites for IgG and albumin**
I.-M. Frick, P. Åkesson, J. Cooney, U. Sjöbring, K.-H. Schmidt, H. Gomi, S. Hattori, C. Tagawa, F. Kishimoto & L. Björck

153 **A seven-gene operon essential for formate-dependent nitrite reduction to ammonia by enteric bacteria**
H. Hussain, J. Grove, L. Griffiths, S. Busby & J. Cole

165 **Transposition of IS*T2* in *Thiobacillus ferrooxidans***
R. Cádiz, L. Gaete, E. Jedlicki, J. Yates, D. S. Holmes & O. Orellana

VOLUME 12 NUMBER 2

Research Articles

171 **Microevolution within a clonal population of pathogenic bacteria: recombination, gene duplication and horizontal genetic exchange in the *opa* gene family of *Neisseria meningitidis***
M. M. Hobbs, A. Seiler, M. Achtman & J. G. Cannon

181 **The *cis*-effect of a nascent peptide on its translating ribosome: influence of the *cat-86* leader pentapeptide on translation termination at leader codon 6**
E. J. Rogers & P. S. Lovett

187 **Thermoregulation in *Yersinia enterocolitica* is coincident with changes in DNA supercoiling**
J. R. Rohde, J. M. Fox & S. A. Minnich

201 **Characterization of the autophosphorylation of Era, an essential *Escherichia coli* GTPase**
P. Sood, C. G. Lerner, T. Shimamoto, Q. Lu & M. Inouye

209 **Differential expression of multiple exo-cellobiohydrolase I-like genes in the lignin-degrading fungus *Phanerochaete chrysosporium***
P. F. G. Sims, M. S. Soares-Felipe, Q. Wang, M. E. Gent, C. Tempelaars & P. Broda

217 **Evolution of antibiotic resistance: several different amino acid substitutions in an active site loop alter the substrate profile of β-lactamase**
T. Palzkill, Q.-Q. Le, K. V. Venkatachalam, M. LaRocco & H. Ocera

231 **Modulated expression of promoters containing upstream curved DNA sequences by the *Escherichia coli* nucleoid protein H-NS**
F. Zuber, D. Kotlarz, S. Rimsky & H. Buc

241 **Peptidase activity of *Escherichia coli* aminopeptidase A is not required for its role in Xer site-specific recombination**
R. McCulloch, M. E. Burke & D. J. Sherratt

253 **The *porA* gene in serogroup A meningococci: evolutionary stability and mechanism of genetic variation**
J. Suker, I. M. Feavers, M. Achtman, G. Morelli, J.-F. Wang & M. C. J. Maiden

267 **Deregulation of temperature-dependent transcription of the invasion regulatory gene, *virB*, in *Shigella* by *rho* mutation**
T. Tobe, M. Yoshikawa & C. Sasakawa

277 **Molecular characterization of intact, but cryptic, flagellin genes in the genus *Shigella***
A. Tominaga, M. A.-H. Mahmoud, T. Mukaihara & M. Enomoto

287 **Molecular characterization of PulE, a protein required for pullulanase secretion**
O. Possot & A. P. Pugsley

301 **Arsenate reduction mediated by the plasmid-encoded ArsC protein is coupled to glutathione**
K. L. Oden, T. B. Gladysheva & B. P. Rosen

307 **Genetic analysis of the *Helicobacter pylori* vacuolating cytotoxin: structural similarities with the IgA protease type of exported protein**
W. Schmitt & R. Haas

321 **Lytic conversion of *Escherichia coli* by bacteriophage T5: blocking of the FhuA receptor protein by a lipoprotein expressed early during infection**
K. Decker, V. Krauel, A. Meesmann & K. Heller

MicroCorrespondence

333 **The *C*-terminal sequence conservation between OmpA-related outer membrane proteins and MotB suggests a common function in both Gram-positive and Gram-negative bacteria, possibly in the interaction of these domains with peptidoglycan**
R. De Mot & J. Vanderleyden

VOLUME 12 NUMBER 3

MicroReviews

335 **DNA-binding proteins as site-specific nucleases**
C. Q. Pan, R. Landgraf & D. S. Sigman

343 **Acquisition and rearrangement of sequence motifs in the evolution of bacteriophage tail fibres**
H. Sandmeier

351 **Why are mammalian alkaline phosphatases much more active than bacterial alkaline phosphatases?**
J. E. Murphy & E. R. Kantrowitz

359 **The ins and outs of protein splicing elements**
M. J. Colston & E. O. Davis

Research Articles

365 **The 24 kDa *N*-terminal sub-domain of the DNA gyrase B protein binds coumarin drugs**
E. J. Gilbert & A. Maxwell

375 **Synthesis of ribosomal proteins during growth of *Streptomyces coelicolor***
G. Blanco, M. R. Rodicio, A. M. Puglia, C. Méndez, C. J. Thompson & J. A. Salas

387 **CooC and CooD are required for assembly of CS1 pili**
B. J. Froehlich, A. Karakashian, L. R. Meisen, J. C. Wakefield & J. R. Scott

403 **Sequence and function of LuxO, a negative regulator of luminescence in *Vibrio harveyi***
B. L. Bassler, M. Wright & M. R. Silverman

413 **Cellobiohydrolase A (CbhA) from the cellulolytic bacterium *Cellulomonas fimi* is a β-1,4-exocellobiohydrolase analogous to *Trichoderma reesei* CBH II**
A. Meinke, N. R. Gilkes, E. Kwan, D. G. Kilburn, R. A. J. Warren & R. C. Miller, Jr

423 **Post-transcriptional regulation of the *groEL1* gene of *Streptomyces albus***
P. Servant, C. J. Thompson & P. Mazodier

433 **Regulation of transcription at the *ndh* promoter of *Escherichia coli* by FNR and novel factors**
J. Green & J. R. Guest

445 **Beta-lactamase topology probe analysis of the OutO NMePhe peptidase, and six other Out protein components of the *Erwinia carotovora* general secretion pathway apparatus**
P. J. Reeves, P. Douglas & G. P. C. Salmond

459 **Transposition of IS*117*, the 2.5 kb *Streptomyces coelicolor* A3(2) 'minicircle': roles of open reading frames and origin of tandem insertions**
T. Smokvina, D. J. Henderson, R. E. Melton, D.-F. Brolle, T. Kieser & D. A. Hopwood

469 **Replication of a *Bacillus subtilis oriC* plasmid *in vitro***
S. Moriya, W. Firshein, H. Yoshikawa & N. Ogasawara

479 **Regulation of the xylanase-encoding *xlnA* gene of *Aspergillus tubigensis***
L. H. de Graaff, H. C. van den Broeck, A. J. J. van Ooijen & J. Visser

491 **Transcription and expression analysis, using *lacZ* and *phoA* gene fusions, of *Mycobacterium fortuitum* β-lactamase genes**

cloned from a natural isolate and a high-level β-lactamase producer
J. Timm, M. G. Perilli, C. Duez, J. Trias, G. Orefici, L. Fattorini, G. Amicosante, A. Oratore, B. Joris, J. M. Frère, A. P. Pugsley & B. Gicquel

505 **A two-component signal-transducing system is involved in competence and penicillin susceptibility in laboratory mutants of *Streptococcus pneumoniae***
E. Guenzi, A.-M. Gasc, M. A. Sicard & R. Hakenbeck

VOLUME 12 NUMBER 4

Research Articles

517 **MycDB: an integrated mycobacterial database**
S. Bergh & S. T. Cole

535 **The gene of the *N*-acetylglucosaminidase, a *Bacillus subtilis* 168 cell wall hydrolase not involved in vegetative cell autolysis**
P. Margot, C. Mauël & D. Karamata

547 **Regulation of a restriction and modification system via DNA inversion in *Mycoplasma pulmonis***
K. Dybvig & H. Yu

561 **Frequency of deletion formation decreases exponentially with distance between short direct repeats**
F. Chédin, E. Dervyn, R. Dervyn, S. D. Ehrlich & P. Noirot

571 **Role of *rpoS* (*katF*) in *oxyR*-independent regulation of hydroperoxidase I in *Escherichia coli***
A. Ivanova, C. Miller, G. Glinsky & A. Eisenstark

579 **NarK is a nitrite-extrusion system involved in anaerobic nitrate respiration by *Escherichia coli***
J. J. Rowe, T. Ubbink-Kok, D. Molenaar, W. N. Konings & A. J. M. Driessen

587 **Molecular basis of the optochin-sensitive phenotype of pneumococcus: characterization of the genes encoding the F_0 complex of the *Streptococcus pneumoniae* and *Streptococcus oralis* H^+-ATPases**
A. Fenoll, R. Muñoz, E. García & A. G. de la Campa

599 **Cloning and characterization of a gene for a 19 kDa fibrinogen-binding protein from *Staphylococcus aureus***
Maria K. Bodén & J.-I. Flock

607 **Heterogeneity of the ribosomal DNA episome in strains and species of *Entamoeba***
F. Cázares, R. Manning-Cela & I. Meza

613 **Identification of lactoferrin-binding proteins from *Treponema pallidum* subspecies *pallidum* and *Treponema denticola***
T. M. Staggs, M. K. Greer, J. B. Baseman, S. C. Holt & V. V. Tryon

621 **Control of the LexA regulon by pH: evidence for a reversible inactivation of the LexA repressor during the growth cycle of *Escherichia coli***
A.-M. Dri & P. L. Moreau

631 **Novel growth rate control of *dam* gene expression in *Escherichia coli***
L. J. Rasmussen, M. G. Marinus & A. Løbner-Olesen

639 **The regulatory RNA gene *micF* is present in several species of Gram-negative bacteria and is phylogenetically conserved**
L. Esterling & N. Delihas

647 **Isolation and characterization of a carboxysome shell gene from *Thiobacillus neapolitanus***
R. S. English, S. C. Lorbach, X. Qin & J. M. Shively

655 **The *Lactococcus lactis* sex-factor aggregation gene *cluA***
J.-J. Godon, K. Jury, C. A. Shearman & M. J. Gasson

665 **'Muprints' of the *lac* operon demonstrate physiological control over the randomness of *in vivo* transposition**
X. Wang & N. P. Higgins

679 **Two mutations that block heterocyst differentiation have different effects on akinete differentiation in *Nostoc ellipsosporum***
F. Leganés, F. Fernández-Piñas & C. P. Wolk

VOLUME 12 NUMBER 5

MicroReview

685 **Protein folding in the periplasm of *Escherichia coli***
C. Wülfing & A. Plückthun

Research Articles

693 **Effects of an isogenic Zn-metalloprotease-deficient mutant of *Legionella pneumophila* in a guinea-pig pneumonia model**
J. F. Moffat, P. H. Edelstein, D. P. Regula, Jr, J. D. Cirillo & L. S. Tompkins

707 **The *ompA* 5′ untranslated region impedes a major pathway for mRNA degradation in *Escherichia coli***
M. J. Hansen, L.-H. Chen, M. L. S. Fejzo & J. G. Belasco

717 **Characterization of IS*1110*, a highly mobile genetic element from *Mycobacterium avium***
M. Hernandez Perez, N. G. Fomukong, T. Hellyer, I. N. Brown & J. W. Dale

725 **A group A streptococcal Enn protein potentially resulting from intergenomic recombination exhibits atypical immunoglobulin-binding characteristics**
A. Podbielski, J. Hawlitzky, T. D. Pack, A. Flosdorff & M. D. P. Boyle

737 **Substrate induction and catabolite repression of the *Streptomyces coelicolor* glycerol operon are mediated through the GylR protein**
Z. Hindle & C. P. Smith

747 **The efficiency of processing and secretion of the thermolysin-like neutral protease from *Bacillus cereus* does not require the whole prosequence, but does depend on the nature of the amino acid sequence in the region of the cleavage site**
D. R. Wetmore, S.-L. Wong & R. S. Roche

761 **Identification and molecular analysis of a locus that regulates extracellular toxin production in *Clostridium perfringens***
M. Lyristis, A. E. Bryant, J. Sloan, M. M. Awad, I. T. Nisbet, D. L. Stevens & J. I. Rood

779 **Regulation of *spvR* gene expression of *Salmonella* virulence plasmid pKDSC50 in *Salmonella choleraesuis* serovar Choleraesuis**
A. Abe, H. Matsui, H. Danbara, K. Tanaka, H. Takahashi & K. Kawahara

789 ***Streptomyces lividans* 66 contains a gene for phage resistance which is similar to the phage λ *ea59* endonuclease gene**
X. Zhou, Z. Deng, D. A. Hopwood & T. Kieser

799 **Identification of a novel sugar-H^+ symport protein, FucP, for transport of L-fucose into *Escherichia coli***
F. J. Gunn, C. G. Tate & P. J. F. Henderson

811 **Mutational analysis of *Agrobacterium tumefaciens* pTiA6 *virD1*: identification of functionally important residues**
A. M. Vogel & A. Das

819 **Generalized transposon shuttle mutagenesis in *Neisseria gonorrhoeae*: a method for isolating epithelial cell invasion-defective mutants**
A. F. Kahrs, A. Bihlmaier, D. Facius & T. F. Meyer

833 **The glucose-starvation stimulon of *Escherichia coli*: induced and repressed synthesis of enzymes of central metabolic pathways and role of acetyl phosphate in gene expression and starvation survival**
T. Nyström

845 **Dual promoters of the *Listeria monocytogenes prfA* transcriptional activator appear essential *in vitro* but are redundant *in vivo***
N. E. Freitag & D. A. Portnoy

MicroCorrespondence

855 **The JUMPstart sequence: a 39 bp element common to several polysaccharide gene clusters**
M. Hobbs & P. R. Reeves

Erratum

857 **The conserved proline-rich motif is not essential for energy transduction by *Escherichia coli* TonB protein**
R. A. Larsen, G. E. Wood & K. Postle

VOLUME 12 NUMBER 6

MicroReviews

859 **A-factor as a microbial hormone that controls cellular differentiation and secondary metabolism in *Streptomyces griseus***
S. Horinouchi & T. Beppu

865 ***Rhs* elements of *Escherichia coli*: a family of genetic composites each encoding a large mosaic protein**
C. W. Hill, C. H. Sandt & D. A. Vlazny

Research Articles

873 ***Streptococcus pyogenes* type IIa IgG Fc receptor expression is co-ordinately regulated with M protein and streptococcal C5a peptidase**
D. La Penta, X. P. Zhang & P. P. Cleary

881 **Peptide permeases modulate transformation in *Streptococcus pneumoniae***
B. J. Pearce, A. M. Naughton & H. R. Masure

893 **Unique fimbriae-like structures encoded by *sefD* of the SEF14 fimbrial gene cluster of *Salmonella enteritidis***
S. C. Clouthier, S. K. Collinson & W. W. Kay

903 **Tyrosine kinase activity in *Pseudomonas aeruginosa***
S. L. South, R. Nichols & T. C. Montie

911 **The functional units of a peptostreptococcal protein L**
J. P. Murphy, C. J. Duggleby, M. A. Atkinson, A. R. Trowern, T. Atkinson & C. R. Goward

921 **Targeted mutagenesis of the phospholipase D gene results in decreased virulence of *Corynebacterium pseudotuberculosis***
P. J. McNamara, G. A. Bradley & J. G. Songer

931 **A Reb1p-binding site is required for efficient activation of the yeast *RAP1* gene, but multiple binding sites for Rap1p are not essential**
I. R. Graham & A. Chambers

941 **Two native plasmids of *Pseudomonas syringae* pathovar tomato strain PT23 share a large amount of repeated DNA, including replication sequences**
J. Murillo & N. T. Keen

951 **The interaction of a recombinant cecropin/melittin hybrid peptide with the outer membrane of *Pseudomonas aeruginosa***
K. L. Piers & R. E. W. Hancock

959 **Genetic and molecular characterization of capsular polysaccharide biosynthesis in *Streptococcus pneumoniae* type 3**
J. P. Dillard & J. Yother

973 **Regulation of acetyl phosphate synthesis and degradation, and the control of flagellar expression in *Escherichia coli***
B. M. Prüß & A. J. Wolfe

985 **Properties of *Acinetobacter calcoaceticus recA* and its contribution to intracellular gene conversion**
L. A. Gregg-Jolly & L. N. Ornston

993 **Bacterial binding protein-dependent permeases: characterization of distinctive signatures for functionally related integral cytoplasmic membrane proteins**
W. Saurin, W. Köster & E. Dassa

1005 **Light-regulated promoters from *Synechocystis* PCC6803 share a consensus motif involved in photoregulation**
P. Marraccini, C. Cassier-Chauvat, S. Bulteau, S. Chavez & F. Chauvat

1013 **Mosaic *pbpX* genes of major clones of penicillin-resistant *Streptococcus pneumoniae* have evolved from *pbpX* genes of a penicillin-sensitive *Streptococcus oralis***
C. Sibold, J. Henrichsen, A. König, C. Martin, L. Chalkley & R. Hakenbeck

1025 **A topological model for the high-affinity nickel transporter of *Alcaligenes eutrophus***
T. Eitinger & B. Friedrich

Indexes

1033 **Keyword Index**

1037 **Author Index**